

Claims

What is claimed is:

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1. A method for detecting a tachycardia, comprising:
- sensing a heart rate;
- comparing the heart rate to a heart rate threshold value;
- initiating an adjustable number of intervals detected (NID)
- threshold upon detecting the heart rate greater than the heart rate
- threshold value;
- 10 resetting the adjustable NID threshold based on at least a first
- measurement of a hemodynamic parameter;
- counting a consecutive number of intervals in which the heart rate
- is greater than the heart rate threshold value; and
- detecting tachycardia if the consecutive number of intervals
- 15 satisfies the adjustable NID threshold.
2. The method of claim 1, further comprising delivering a first therapy
- upon detecting tachycardia.
- 20 3. The method of claim 2, further comprising:
- comparing a second heart rate to the heart rate threshold value
- after delivery of the first therapy;
- resetting the adjustable NID threshold to a second adjustable NID
- threshold based on at least a second measurement of the hemodynamic
- 25 parameter;
- counting a consecutive number of intervals in which the second
- heart rate is greater than the heart rate threshold value; and
- delivering a second therapy if the consecutive number of intervals
- in which the second heart rate is greater than the heart rate threshold
- 30 value satisfies the second adjustable NID threshold.

4. The method of claim 1, further comprising storing one or more parameters relating to the tachycardia.
5. The method of claim 1, wherein the hemodynamic parameter is blood pressure.
6. The method of claim 5, wherein resetting the adjustable NID threshold comprises reducing the adjustable NID threshold in response to a drop in blood pressure.
7. The method of claim 1, wherein the hemodynamic parameter is blood flow.
8. A method for detecting tachycardia, comprising:
initiating an adjustable number of intervals detected (NID) threshold upon detecting a heart rate greater than a heart rate threshold value;
resetting the adjustable NID threshold based on a physiologically-sensed condition;
counting a consecutive number of intervals in which the heart rate is greater than the heart rate threshold value; and
detecting tachycardia if the consecutive number of intervals is equal to or greater than the adjustable NID threshold.
9. The method of claim 8, further comprising delivering a first therapy upon detecting tachycardia.
10. The method of claim 8, wherein detecting tachycardia comprises detecting ventricular tachycardia.
11. The method of claim 8, wherein the physiologically-sensed condition is blood pressure.

12. The method of claim 8, wherein the physiologically-sensed condition is blood flow.

5 13. The method of claim 8, wherein resetting the adjustable NID threshold comprises modifying the adjustable NID threshold in accordance with a predetermined relationship between the physiologically-sensed condition and the NID threshold.

10 14. A method for detecting a cardiac event and delivering a therapy in response thereto, comprising:

sensing at least one first R-R interval;

comparing the at least one first R-R interval to an interval threshold value;

15 initiating a first adjustable number of intervals detected (NID) threshold upon detecting the at least one first R-R interval less than the interval threshold value;

sensing a first hemodynamic measurement;

20 resetting the first adjustable NID threshold based on the first hemodynamic measurement;

counting a first consecutive number of R-R intervals in which each of the first consecutive number of R-R intervals is less than the interval threshold value;

25 detecting tachycardia if the first consecutive number of R-R intervals is equal to or greater than the first adjustable NID threshold; and delivering a first therapy.

15. The method of claim 14, further comprising:
sensing at least one second R-R interval;
30 comparing the at least one second R-R interval to the interval threshold value;

initiating a second adjustable number of intervals detected (NID) threshold upon detecting the at least one second R-R interval less than the interval threshold value;

sensing a second hemodynamic measurement;

5 resetting the second adjustable NID threshold based on the second hemodynamic measurement;

counting a second consecutive number of R-R intervals in which each of the second consecutive number of R-R intervals is less than the interval threshold value;

10 detecting tachycardia if the second consecutive number of intervals is equal to or greater than the second adjustable NID threshold; and

delivering a second therapy.

15 16. The method of claim 15, further comprising storing one or more parameters relating to the tachycardia.

17. The method of claim 15, wherein one or both of the first and second hemodynamic measurements is a blood pressure measurement.

20 18. The method of claim 15, wherein one or both of the first and second hemodynamic measurements is a blood flow measurement.

19. The method of claim 17, wherein resetting one or both of the first adjustable NID threshold and second adjustable NID threshold comprises reducing the first adjustable NID threshold and second adjustable NID threshold in response to a drop in blood pressure.

25 20. A pacing apparatus, comprising:
30 sensing and pacing circuitry for sensing cardiac activity and generating pacing pulses;
a hemodynamic sensor; and

controller circuitry in communication with the hemodynamic sensor, the controller circuitry operable to:

- sense a heart rate using the sensing and pacing circuitry;
- compare the heart rate to a heart rate threshold value;
- 5 initiate an adjustable number of intervals detected (NID) threshold upon detecting the heart rate greater than the heart rate threshold value;
- reset the adjustable NID threshold based on at least a first measurement of a hemodynamic parameter;
- count a consecutive number of intervals in which the heart rate is greater than the heart rate threshold value; and
- detect tachycardia if the consecutive number of intervals satisfies the adjustable NID threshold.

21. The pacing apparatus of claim 20, wherein the sensing and pacing circuitry is further operable to deliver a first therapy upon detection of tachycardia.
22. The pacing apparatus of claim 20, wherein the hemodynamic sensor is a blood pressure sensor.
23. The pacing apparatus of claim 20, wherein the hemodynamic sensor is a blood flow rate sensor.
24. The pacing apparatus of claim 20, wherein the pacing apparatus is a PCD.
25. A pacing apparatus, comprising:
- sensing and pacing circuitry for sensing cardiac activity and generating pacing pulses;
 - 30 a hemodynamic sensor; and

controller circuitry in communication with the hemodynamic sensor, the controller circuitry operable to:

- initiate an adjustable number of intervals detected (NID) threshold upon detecting a heart rate greater than a heart rate threshold value;
- reset the adjustable NID threshold based on a physiologically-sensed condition;
- count a consecutive number of intervals in which the heart rate is greater than the heart rate threshold value; and
- detect tachycardia if the consecutive number of intervals is equal to or greater than the adjustable NID threshold.

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26. The pacing apparatus of claim 25, wherein the sensing and pacing circuitry is further operable to deliver a first therapy upon detection of tachycardia.
27. The pacing apparatus of claim 25, wherein the hemodynamic sensor is a blood pressure sensor.
28. The pacing apparatus of claim 25, wherein the hemodynamic sensor is a blood flow rate sensor.
29. The pacing apparatus of claim 25, wherein the physiologically-sensed condition is blood pressure.
30. The pacing apparatus of claim 25, wherein the physiologically-sensed condition is blood flow.
31. The pacing apparatus of claim 25, wherein the pacing apparatus is a PCD.
32. A pacing apparatus, comprising:

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5 sensing and pacing circuitry for sensing cardiac activity and
generating pacing pulses;
a hemodynamic sensor; and
controller circuitry in communication with the hemodynamic
sensor, the controller circuitry operable to:

10 sense at least one first R-R interval;
compare the at least one first R-R interval to an interval
threshold value;
initiate a first adjustable number of intervals detected (NID)
threshold upon detecting the at least one first R-R interval less
than the interval threshold value;
sense a first hemodynamic measurement;
reset the first adjustable NID threshold based on the first
hemodynamic measurement;

15 count a first consecutive number of R-R intervals in which
each of the first consecutive number of R-R intervals is less than
the interval threshold value;
detect tachycardia if the first consecutive number of R-R
intervals is equal to or greater than the first adjustable NID
threshold; and

20 deliver a first therapy.

33. The pacing apparatus of claim 32, wherein the controller circuitry
is further operable to:

25 sense at least one second R-R interval;
compare the at least one second R-R interval to the interval
threshold value;
initiate a second adjustable number of intervals detected (NID)
threshold upon detecting the at least one second R-R interval less than
30 the interval threshold value;
sense a second hemodynamic measurement;

reset the second adjustable NID threshold based on the second hemodynamic measurement;

count a second consecutive number of R-R intervals in which each of the second consecutive number of R-R intervals is less than the interval threshold value;

detect tachycardia if the second consecutive number of R-R intervals is equal to or greater than the second adjustable NID threshold; and

deliver a second therapy.

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34. The pacing apparatus of claim 32, wherein the hemodynamic sensor is a blood pressure sensor.

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35. The pacing apparatus of claim 32, wherein the hemodynamic sensor is a blood flow rate sensor.

36. The pacing apparatus of claim 32, wherein the pacing apparatus is a PCD.